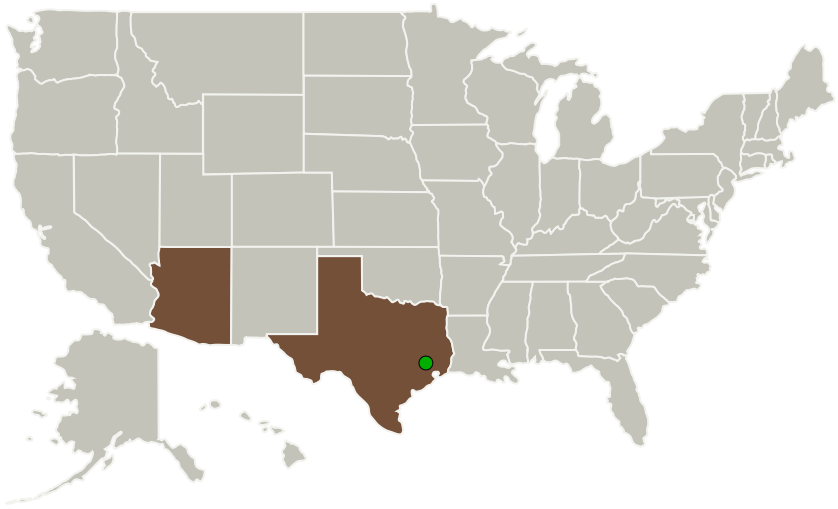
# Integrated Sublimator Driven Coldplate for use in Active Thermal Control System, Phase I

Completed Technology Project (2010 - 2010)

## Project Introduction

The original Sublimator Driven Coldplate (SDC) design sought to provide significant mass savings over a traditional pumped fluid loop by combining the functions of a cold plate and a sublimator and eliminating the fluid loop (Leimkuehler, et. al., "Design of a Sublimator Driven Coldlpate Development Unit," 2008-01-2169). The target application was to provide heat rejection for the ascent module of the Altair lunar lander vehicle during the lunar ascent mission phase. However, in order to provide heat rejection for the ascent module during the rest of the mission, it is desirable to keep the ascent module integrated with the fluid loop in the rest of the Altair vehicle. Therefore, we propose an Integrated Sublimator Driven Coldplate (ISDC) that can function as both a standard flow-through cold plate and a Sublimator Driven Coldplate. The ISDC builds on the original SDC concept by adding coolant layers so that it can be integrated with the pumped fluid loop on the rest of the vehicle. This approach provides mass savings by (1) combining multiple pieces of hardware into a single piece of hardware and (2) providing additional fault tolerance without the need for redundant hardware.

## Primary U.S. Work Locations and Key Partners

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| Organizations Performing Work | Role | Type | Location |
|---|---|---|---|
| Paragon Space Development Corporation | Lead Organization | Industry | Tucson, Arizona |
| Johnson Space Center(JSC) | Supporting Organization | NASA Center | Houston, Texas |

| Primary U.S. Work Locations | |
|---|---|
| Arizona | Texas |

## Project Transitions

**January 2010:** Project Start

**July 2010:** Closed out

**Closeout Summary:** Integrated Sublimator Driven Coldplate for use in Active T hermal Control System, Phase I Project Image

**Closeout Documentation:**

- Final Summary Chart Image*(https://techport.nasa.gov/file/140087)*

## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Organization:**

Paragon Space Development Corporation

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

**Principal Investigator:**

Thomas Leimkuehler

**Co-Investigator:**

Tom Leimkuehler

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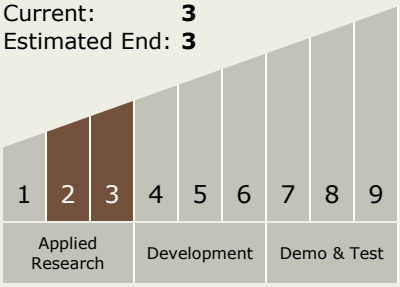
## Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **3**




## Technology Areas

**Primary:**

- TX14 Thermal Management Systems
  - TX14.2 Thermal Control Components and Systems
    - TX14.2.1 Heat Acquisition

## Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System